

Review & Analysis

Exercise Compliance: Does the US Air Force Have Unique Opportunities?

Prepared for: Performance Enhancement Division
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11. SUPPLEMENTARY NOTES This Review & Analysis includes descriptions of fitness programs for military and non-military environments, the models of exercise compliance and adherence that can offer some insight as to what methods may encourage exercise adherence, and some of the motivators and incentives that make a fitness program successful. A workshop was held to seek consensus, opinions, and approaches on topics relevant to the Air Force's opportunities to enhance exercise compliance and adherence. The workshop proceedings can be found in <i>Exercise Compliance: Does the US Air Force Have Unique Opportunities?</i> (HSIAC-PR-2001-001)				
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FOREWORD

This publication documents a *Review & Analysis* of principles that guide adherence to exercise and fitness programs. This work was performed by the Human Systems Information Analysis Center (HSIAC) for the Air Force's School of Aerospace Medicine, Department of Force Enhancement. It was conducted under Department of Defense Contract Number SPO700-98-D-4001. A companion publication, *Workshop Proceedings: Exercise Compliance: Does the US Air Force Have Unique Opportunities?* (HSIAC-PR-2001-001), documents the workshop proceedings of military and civilian subject-matter experts who gathered at Brooks AFB in August 2001 to reach consensus on this topic.

Special thanks go to Dr. Andrea Dunn for her many contributions to this *Review & Analysis*.

EXECUTIVE SUMMARY

Physical fitness programs are designed to maintain and improve the health and wellness of program participants. Encouraging people to start and maintain a regular regimen of physical activity is important in many arenas, especially when the concern is for military readiness and the health of service members. The United States Air Force is interested in exploring unique possibilities that might be available to them to encourage physical activity among their troops.

This *Review & Analysis* documents guiding principles in fitness program compliance and reviews the fitness program and fitness requirements of the Army, Navy, Air Force, and Marine Corps. Emergency services personnel in the civilian sector with exemplary programs are highlighted, as is the history of workplace-centered fitness programs.

Constructs are documented for several theoretical exercise compliance models:

Behavior Choice Theory
Social Cognitive Theory
Social Ecological Model
Theory of Reasoned Action
Theory of Planned Behavior
Health Belief Model
Trans-theoretical Model/Stages of Motivational Readiness
Transaction Model of Stress and Change

Major determinants of exercise adoption and maintenance include motivational strategies of the program, the opportunity for a varied set of activities, a sense of community, the physical environment, and attitudes, knowledge, and approaches to the program. The social environment is possibly the greatest factor, with results of studies showing that group versus individual-based exercise programs have superior compliance rates.

Several military and civilian physical fitness professionals and program officers met in August, 2001 to seek consensus, opinions, and approaches to the Air Force's opportunities to encourage service member physical fitness activities.

The subject matter experts reached consensus on the following exercise compliance initiatives for the Air Force to address:

1. Assess current status of the force to include assessment of physical activity among members and a readiness (to exercise) stage assessment.
2. Conduct education, marketing and training in physical activity to both members and senior leadership.
3. Discover and employ lessons learned and several suggested best practices.

4. Evaluate physical fitness tests and standards for commonality, connectivity, standardization, alternatives and graded metrics.
5. Justify and implement programs, determining goals and objectives, baseline scores and beliefs, and providing education early in program.
6. Conduct program maintenance, targeting motivational support for the long term.
7. Integrate program success factors such as support group concepts and goal setting.
8. Develop motivational strategies to increase and maintain adherence.
9. Avoid attrition via awareness and counter strategies and techniques, *i.e.*, address barriers to exercise.
10. After addressing health-based exercise recommend to senior leadership development of occupation-related fitness and exercise adherence.

1. Introduction

The Air Force would like to explore and potentially incorporate any unique opportunities to encourage maximal member participation in a personal fitness program, based on the findings of past researchers. The active duty military environment presents special considerations in the areas of exercise prescription and compliance, yet has not received as much attention as other work environments. The research that is explored in this report includes descriptions of fitness programs particularly in the work environment, the models of exercise compliance and adherence that can offer some insight as to what methods may encourage exercise adherence, and some of the motivators and incentives that make a fitness program successful. In looking at what type of exercise programs exist for the military and non-military environments, how and why existing programs came to be and most importantly how to improve upon existing exercise compliance efforts for the Air Force are the focus for improving exercise compliance.

1.1. Background

Physical fitness programs serve to maintain and improve the health and wellness of people. They have become increasingly necessary as modern living becomes more automated and therefore allows us to complete tasks without as much physical labor as decades ago. Since human bodies are not forced to work the same physically demanding jobs or act as a mode of transportation, the energy expenditure of most individuals has declined. One marker of this decline are the rising obesity rates. This decreased energy expenditure is associated with increased morbidity and mortality. The consensus recommendations from the U.S. Surgeon General the Centers for Disease Control and Prevention and the American College of Sports Medicine (Pate, et al., 1995) outlines the importance to health and quality of life of an active lifestyle. The rewards and benefits of exercise are innumerable in staving off some of the aforementioned maladies, as well as offering some additional benefits such as treating and intervening in various psychological disorders (i.e., stress, self-esteem, depression), creating and enhancing social relationships and acting as a therapy for substance abusers.

As stated in *Expanded Air Force Physical Fitness Battery: Muscle Strength, Muscle Endurance, and Flexibility Considered* (Palmer & Soest, 1997), the military's everyday work arena benefits from a fit workforce in ways beyond improved deployment readiness. It is agreed throughout the literature that workers in industrial and corporate settings who are fit, are more productive, happier, absent less often, and injured less on-the-job, suffer less from fatigue and make fewer errors (Palmer & Soest, 1997; USDH & HS, 2000). Likewise, advantages of workplace (corporate) fitness programs have also been reported by employees to include improved attitude, more stamina and lost weight, increased morale, and a more constructive outlet to reduce stress. The military may be able to take advantage of the lessons learned from some of the corporate and industrial environments that have employed fitness and wellness programs.

Increasing the levels of physical activity among military service members is vital for readiness, job performance, and improved health, yet a systematic and effective approach to promoting good health behaviors, including a physically active lifestyle, remains elusive. A soon-to-be-published Institute of Medicine book, *Health and Behavior: The Interplay of Biological, Behavioral, and Social Influences*, examines the latest literature about biological, psychological, and social determinants of health behavior and views the efficacy of several kinds of interventions. The breadth of variables which affect health choice behavior is reflected in the 1982 Institute of Medicine report on Health and Behavior, which used the term "bio-behavioral sciences" in reference to the many relevant disciplines that contribute to health behavior knowledge. "The term bio-behavioral sciences includes not only the behavioral sciences that conduct experimental analyses of animal and human behavior but is broadly inclusive of relevant sciences such as neuroanatomy, neurology, neurochemistry, endocrinology, immunology, psychology, psychiatry, epidemiology, ethnology, sociology, and anthropometry, as well as the new interdisciplinary fields such as behavioral genetics, psychoneuroimmunology, and behavioral medicine (Institute of Medicine, 2001).

The workplace offers a unique environment for health choice programs. Health and wellness programs offered within the work environment in the form of corporate wellness or corporate fitness programs have been implemented for the past 40 years. Targeting the workplace to promote healthy lifestyles makes sense since at least 1/3 of our waking hours are spent at work, where communication is organized and peers exert support and pressure (Pencak, 1991). Employees, as well as employers, reap the rewards of corporate fitness programs as employees attain greater wellness and enhanced productivity. Corporations can attract people with a favorable attitude toward work and health, employers benefit from reduced employee absenteeism and turnover, and healthcare costs are reduced since healthier employees are more productive and cost less, in terms of health insurance and unworked sick days (Shephard, 1999, DiMenna, 1995). Statistics show that industry pays out \$10 billion each year in sick pay, 100,000 deaths occur from cardiovascular disease, 500 million workdays are lost for sick time or disability (due to heart disease, hypertension, back pain), heart attacks strike a half-million people during the most productive time of their lives, and people suffering from back pain resulting from neglected muscles take advantage of worker's compensation programs (Covenant Health, 1998). Workplace stress and lack of exercise are risk factors for high blood pressure and depression and can contribute to asthma attacks. Employers who offer targeted health management programs encourage employees to take better care of themselves since they are more knowledgeable and prepared. A 1987 study found that among new hires and veteran employees (4 years), turnover was reduced with the initiation of a fitness program (Tsai, Baun, Bernacki, 1987). There was no investigation as to whether this was causal, as turnover is due to many different factors. The differences were significantly profound for female clerical employees. Encouraging participation at work with lunchtime health seminars, smoking cessation programs, on-site fitness centers, and counseling can all serve to maintain a healthy workforce (Steinbach, 2000).

The ultimate reward is health, but some programs may offer additional incentives for employees such as monetary compensation. This is an important issue to consider since long-term participation can become a challenge (Shepard, 1999). Lack of adherence will result in a loss of the health-related benefits mentioned previously. Dropout rates can be considerable, and the group of dropouts is usually comprised of those who are in most need of the exercise program (Dishman, Sallis, & Orenstein et al., 1985). To reduce dropout and encourage compliance in exercise participation requires some effort on the parts of the participant and the program design.

2. Training Programs

Physical fitness programs come in many shapes and sizes depending on what the target goals are and what population is participating. There are programs designed for a special interest or goal such as weight loss, physical rehabilitation, cardiac rehabilitation, stress management or just overall health. These can be found within the community, as in-patient or out-patient programs at a hospital, or within the work environment. Also, there are programs that are not "voluntary", such as the military services, fire departments, etc., and have physical fitness tests and standards associated with them. (Constable & Palmer, 2000)

2.1. Program Design

Gathering preliminary data is the crucial first step to design an employee fitness program. It is important to find out what the employees want, what the outcome goals should be, and what the business needs to accomplish from its health promotion program. Sources of data include facility assessments, absenteeism rates, health risk appraisals, health screenings, and cultural audits. Calculating the return on investment is a significant consideration prior to program design. Preventive care programs to improve overall health, goal-specific programs and coaching will all help to accomplish the identified goals (Martinez, 1999). Some examples of industry health program features are education programs (classes and self-study), financial incentives, health promotion, and on-site fitness facilities (Reardon, 1998). A certified personal trainer should address the specific component that encourages the participant to realize their goal(s). Priority training and the availability of a well-equipped facility can help to meet individual's program goals, time and energy restraints (DiMenna, 1995).

It was noted in the literature that companies with fitness programs are moving away from specific weight criteria because weight alone is not usually considered a health status factor. Studies are showing that adverse effects of excess weight may be overestimated, and that measuring weight and body fat is considered invasive among certain people (Brotherton, 1998). On the other hand, a program that is designed with a special interest such as for weight loss will train its participants to exercise at the appropriate intensity and duration recommended for appropriate weight loss. Though overweight people lose weight with caloric restriction without exercise the weight loss is partially due to loss of lean body mass. Exercise has been shown to be the favorable alternative for body fat distribution and is important for maintaining weight loss in the prevention of weight gain (i.e., weight control) (Blair, 1993).

A study by Reardon (1998) found that participation is driven by personal motivation more so than by health education. Role models and leaders are needed to encourage healthy and active participation. There are three levels of awareness programs intended to (I) deliver knowledge, (II) change behavior through knowledge and follow-up, and (III) maintain a healthy lifestyle. As a person becomes more comfortable with the lifestyle changes, it will be easier to incorporate other components.

2.2. Military and Other Uniformed Services Fitness Requirements

2.2.1. Air Force

Duty-specific fitness programs which emphasize fitness goals based on tasks to be performed, especially during wartime, is gaining more interest among the services. Though many of the Air Force warfighters are pilots, not ground troops or infantry, there is still an emphasis on readiness for deployment and there are many occupations within the Air Force, performed on an ongoing basis, which require physical labor. Medical personnel, civil engineering or maintenance units are known to lift and load on a daily basis and must be ready to build tents and carry gurneys. The Strength Aptitude Test (SAT) tests the weight-lifting capacity of Air Force recruits at the Military Entrance Processing Stations (MEPSs) to help ensure their ability to meet occupational demands such as lifting and pushing.

The Air Force Fitness Program (AFFP) attempts to carry out the Air Force Surgeon General's initiative on health and readiness and healthy communities. The Air Force Fitness Program Office was established in June 1995, by the Air Force Medical Operations Agency to implement, sustain, and support the Air Force Fitness Program for all Air Force members. AFFP policy and procedures are maintained by the Air Force Surgeon General. Over the past three years, the Air Force fitness program has undergone evaluation to determine its adequacy and as a result, experienced some changes in testing requirements. The new requirements have been appended to include muscular endurance in addition to the existing requirement for cardiovascular capacity.

The Air Force currently mandates the use of submaximal cycle ergometry to estimate aerobic fitness, crunches, and push-ups to evaluate muscular strength and endurance, which can be considered, among others, representative measures of total physical fitness. The muscular strength portions of the testing criteria were added to the testing series as of July 2000. Pass/fail standards should be established in January 2002. Body composition standards are also maintained by the Air Force (Hodgdon & Friedl, 1999).

The Air Force Fitness Program has recently balanced its mandated fitness to current DoD standards to include strength and flexibility training. Strength training should represent the kinds of actions that might be required during deployment activities and emergency conditions. It is especially recommended for personnel who do not ordinarily perform physical labor in their daily jobs, yet may be called upon during a national emergency. Flexibility is encouraged as a part of training, but is not tested. The current Air Force fitness instruction authorizes but does not mandate duty time for physical fitness but individual commanders can require on-duty physical training. Aerobic fitness improvement and maintenance is the responsibility of the entire fitness team – member, unit commander, services personnel, medical personnel, and installation commander. Activities should be chosen that make exercise fun and more enjoyable so that it helps people adopt it as a lifestyle habit (Ide, 2001).

A recommendation was made by Robins, Chao, Fonseca, Snedecor and Knapik (2001) to encourage aerobic exercise prescription for individuals. Their recent study of demographics and exercise compliance among members of the Air Force showed that those who failed their fitness test in the previous year might be low responders to the physical adaptations of exercise. Therefore, those individuals may have to exercise more (higher intensity, more frequency) than their counterparts who had passed the previous year. Existing physical fitness programs are targeted to all Air Force staff, which is beneficial for those who are considering an exercise program, but there is also a need to target the high-risk groups. Individual attention may be needed for high-risk groups.

2.2.2. Army

For enlisted personnel and NCOs in the Army, there is mandatory physical training each morning. Officers are responsible for their own physical conditioning program. Training can be voluntary or mandatory depending on the post.

The Army's Physical Fitness Test (APFT) is conducted twice a year and consists of a 2-mile run, push-ups and sit-ups. The aerobic portion may be substituted with a 6.2-mile bicycle, 2.5-mile walk or 800-yard swim. Flexibility is not measured. Weight and body composition are assessed during the APFT.

The Fort McPherson Worksite Fitness Program is a Department of the Army program to encourage civilian employees to improve their health and fitness through exercise and other positive health habits. "Formal" exercise training consists of a written agreement and may be performed individually, with a group, or with a buddy. (Newcomb, 1998). The basic elements of the six-month program include up to 3 hours each week of excused absence for physical fitness training, participant evaluation both before and after starting the program, and monitoring throughout the program. Exercise and nutritional education is also available for commanders to use.

2.2.3. Navy

The Navy has a physical readiness program designed to "environments, to support operational readiness" (Chief of Naval Operations, 1998). Mandatory exercise was implemented by NAVADMIN 148/94 in 1994 (Navy News Service, 1994) and specifies that commanding officers enforce exercise three times per week for all hands unless other operational commitments conflict. Exercise sessions should include at least 20 minutes of aerobic activity, strength and flexibility training, plus a warm-up and cool-down. The Naval Health Research Center is developing job-relevant training programs in response to the DoD 1308.1, which ordered each military Service to develop such programs to meet the specific task requirements of their personnel. SPARTEN (Scientific Program of Aerobic and Resistance Training Exercise in the Navy) is an on-ship program that implements aerobic and circuit training rather than aerobic and callisthenic conditioning for developing total body fitness.

The Navy's fitness program conducts the Physical Fitness Assessment (PFA) twice a year and includes Physical Activity Risk Factor Screening, body composition assessment and the Physical Readiness Test (PRT). The PRT consists of 1.5-miles walk/run, push-ups, sit-ups and curl-ups, sit and reach and a cool-down period. A 500-yards/450-meter swim test may serve as an alternate for the walk/run. (Navy News Service, 2000)

2.2.4. Marine Corps

The Marine Corps Physical Conditioning Program consists of anaerobic conditioning, progressive resistance training, and aerobic conditioning to promote everyday work effectiveness, combat readiness, leadership, and self-discipline. Marines participate in a minimum of three hours of physical fitness training per week as required by the Marine Corps Order 61003J.

Marine Corps physical fitness testing is conducted twice a year. Men and women run 3 miles, and do sit-ups, while women perform a flexed arm hang and men do pull-ups/chin-ups. Body composition is also measured.

GAO noted that significant differences exist in the tests and standards that the military services use to measure physical fitness with varying levels of difficulty in required performance areas. The services did not always adhere to DoD guidelines for fitness testing and may have interpreted guidance differently (GAO, 1998). Exercise programs for the other three branches of the military and other uniformed services, such as fire and police departments that are instituting health and fitness programs into their work environment are discussed in the following paragraphs.

2.2.5. Other Uniformed Services

The FBI allows three hours per week of work time for physical training. Requirements are based on readiness and that healthy workers are productive workers. Personnel must keep records of their activity.

The US Secret Service grants three hours of duty time per week for workouts.

2.2.6. Fire Departments

Norfolk Professional Firefighters have invested time and money to advance the fitness of its members and fire service as a whole. This initiative was motivated by a data set published by the insurance companies stating that firefighters were at higher risk for stress, heart attacks, hypertension and six types of cancer. A program was conceived and designed by the Norfolk firefighters. The two largest organizations closest to Norfolk (Fairfax County, VA and Charlotte, NC) came to a consensus on a wellness program in which firefighters would compete against themselves, not a clock or others. Positive reinforcement is used to encourage a healthy work force rather than a punitive approach.

An annual test includes a stress test, a complete physical, x-rays, and an agility test. If a firefighter is identified as overweight, then he/she is encouraged to lose the pounds before the next testing. An employee does not get terminated if they fail testing. The Norfolk Fire Company is geared towards a wellness program, not a fitness test, to promote a healthy lifestyle (Steffens, 1998).

The physical fitness program of the Santa Clara County Fire Department is under the medical supervision of the fire department physician. Supervisors are held responsible for overseeing all fitness workout activities. Activities are non-contact, non-competitive, and do not interfere with normal duties. The program is mandatory for all personnel. Personnel aged 40-years and older are examined every year and before they are reassigned to emergency duties following a debilitating illness or injury. All others are examined every two years. Physical fitness profiles are completed every two years. Fitness testing is non-competitive and designed to encourage "best effort" for establishing individual baselines, and Department program effectiveness. Training is designed for the individual to work to their optimum level. Emergency response units will be provided an exercise period for fitness maintenance and improvement using their designed program. Others can request a workout schedule subject to approval by their supervisor and which does not impact workload. Workouts are conducted at fire department facilities unless the department does not maintain a facility, in which case the staff may join a health club. The hours allowed for training are 30 minutes of the employee's own time before and after working hours in order to maintain a 1-hour workout program. High injury risk and contact sports are prohibited such as basketball, football or volleyball. Emergency response personnel are subject to fitness standards that include: a minimum of 40ml/kg VO_{2max} for during a submaximal bike test; 1-1/2 mile run completed in 12 minutes or less; a minimum of 40 ml/kg VO_{2max} when run on treadmill; strength requirements are 3 pull-ups (palms in or out), flexed arm hang held for 45 seconds, 20 push-ups in 30 seconds, 30 sit-ups (crunches) in 60 seconds; flexibility measured by hip flex (sit & reach) 12-inch minimum. Body composition will remain a part of the Department testing though only advisory.

Ten fire departments in the US and Canada began an unprecedented effort to develop physical fitness and wellness programs for firefighters. Cities incorporating such programs include Metro-Dade, Indianapolis, and Phoenix. Wellness efforts include health risk appraisals, behavioral change efforts, smoking cessation classes, and referrals to primary care physicians. The rules are that health information is confidential, geared towards performance testing and non-punitive. Fitness evaluations are for strength, endurance, and aerobic capacity. In Indianapolis, over 92% of firefighters have met the required fitness standards. Data analysis showed that blood pressure significantly decreased among firefighters due to the effects of this specific program. (Dezelan, 1997)

2.3. Corporate Fitness Programs

Corporate settings have experienced the challenge of sustaining long-term participation in health and wellness programs throughout their history. Early corporate

programs consisted of company sponsored sports teams and maybe even sports fields at work sites to boost team building and employee morale but the numbers that became involved were relatively small. In the early 1960's the idea of a callisthenic break to reduce employee stress and enhance physical and mental performance was introduced, but it proved unrealistic in modern working environments for an entire team to take a 7-8-minute group exercise break twice a day. During the 1970s, US and Canadian governments were busy promoting the development of work-site fitness programs in order to build a healthy overall working environment. It was thought that the lack of time problem could be overcome by eliminating travel-time. The advantages of being able to offer attractive fringe benefits and lower healthcare costs were motivating factors for some managements to sponsor work-site wellness projects.

Long-term interest continued to remain a big challenge. Statistically, a third of employees are likely to join, but then about half become non-compliant after a few months. Attendance may be facilitated by involving senior management, adopting flexible work hours, admitting family members, and providing modular programs (advice on nutrition, weight loss, back pain, stress, substance abuse, etc.).

A program's success is typically measured by the number of members who maintain compliance and the duration for which they continue to comply. *Success*, however, can be an unclear term. In a study by Blair (1993), success depended on the severity of weight loss. For another, success meant adhering to a prescribed exercise routine at least two thirds of the time during the second year. Exercise program format, baseline BMI and perceived stress levels were identified as successful predictors of adherence for year 1 and 2 (King et al., 1997). Yet, DiMenna et al. (1995) writes, "success" is a person still doing the specialized program six months later. For one community exercise program, success was indicated for 26 city employees who walked 20-30 minutes/day, 3-5 days/week which averaged to 4 1/2 days/week exercised (Csencsits, 1999). Regardless of what the definition of success is decided to mean for each work environment, a critical ingredient to success is management support.

Success was once gauged by employees' awareness and attitude towards the wellness program, as well as markers of interest such as contemplation of participation or whether they obtained membership to the fitness facility. However, 20 years later, hard evidence that employees are, in fact, more active and have realized improved wellness, is being sought to measure economic benefits. In the evaluation of work-site programs, it is important to set stringent criteria that they all must meet for an informative and effective analysis. The data must be unbiased - inferring that during low attendance periods, data may not be collected. An experimental approach is difficult to achieve in an industrial or corporate environment since it is impossible to avoid interaction between experimental and control groups, and management wants all employees to have full access to the wellness facilities and associated activities. Even a "quasi-experimental" approach is difficult because work site locations with similar demographics and management philosophies are difficult to match. Therefore, most responses to the effects of wellness/fitness programs have little to do with statistics but more from a management

perception of reduced absenteeism, increased productivity, employee turnover and modifications in lifestyles choices such as smoking or alcohol/substance abuse.

The hard evidence that can be measured is physiological data. This data may be collected to measure improvements in cardiovascular fitness, changes in blood pressure, and body composition but must be measured initially and maintained throughout the long-term. An example of successful outcomes of a corporate fitness program was at Johnson & Johnson. Employees were tested for aerobic fitness via cycle ergometer at experimental and control work-sites for a large sample. Though the experimental groups showed a 10% increase in fitness score over 2 years, this could have been due to test learning and that the sample population was older than 45 years, who have a greater potential of improving fitness levels. Similarly, the Canada Life Insurance study looked at the effects exercise had on medical care costs. The study showed that medical care costs were decreased for the group who exercised compared to workers who did not. Participants experienced a 20% gain in fitness but those participants were the ones that became regular and enthusiastic participants. It is possible, however, that the increases in fitness levels and exercise participation were motivated by the fact that the participants saw measurable changes. (cited in Nieman, 1995)

Other measurable impacts on health include changes in body mass, body fat, aerobic power, muscular strength, flexibility, cardiac risk factors (blood pressure, cholesterol), life satisfaction and well-being, illness, injury, smoking. An indicator of improved mood may be an early reduction in medical claims, since people who feel good are less likely to visit a doctor. In one study of firefighters, there was a reduced rate of increased heart rate in response to a fire alarm among those who participated in a fitness program. Educating employees about the extensive range of benefits that can be gained through exercise rather than focusing on more common aspects such as weight loss may help to motivate those who have not yet started an exercise program and those who may find it difficult to modify their lifestyle to adhere to a regular exercise routine.

2.4. Lessons Learned

The lesson that can be learned from historical accounts of fitness programs is that work-site wellness programs are not very effective in enhancing habitual physical activity or markers of wellness. The opposite is true for university populations, perhaps because of more relaxed schedules or higher levels of education among participants. Suggestions for improvement are to investigate the merits of behavior modification and use of incentives, focus attention on dropouts and put a greater emphasis on encouraging the adoption of a healthy lifestyle. It seems that the most effective tactic is to provide active outreach to nonparticipating employees, a well-equipped fitness facility and a supportive physical and social environment that encourages a healthy lifestyle. When physical activity levels were essentially doubled among corporate employees participating in a corporate fitness program, fitness performance improvements were seen among participants. The smallest gains in fitness at corporate settings were those that used a

health-education/risk-appraisal approach. The largest gains were seen in public agencies and university settings that utilized incentive programs. (Shepard, 1999)

Testimonials of corporate programs that have had positive results include those from DuPont and Eastman Chemical. DuPont, a large international company, and Mercury Marine, a smaller company, have implemented corporate wellness programs. Both have seen decreased health care and workmen's compensation costs, reduced employee turnover, decreased absenteeism, a more efficient workforce, increased morale and the ability to retool their workforce for the future. An employee's involvement requires a willingness to participate. One way to encourage participation is to give the employees a sense of ownership, such as seeking out their concerns, and forming a group of volunteers to serve as the ambassadors for the program. Prevent the appearance that the program is run by one person or entity. Eastman Chemical implemented a comprehensive wellness program that includes health profiles, health improvement programs, exercise classes, and personal exercise guidelines. It has saved almost \$12 million in health care reduction and reduced absenteeism and has also served to provide employee empowerment and treating employees as the heart of the company (Bourne, 1999).

Physical environmental factors can be opportunities to promote fitness in the workplace. Work sites that offer safe and accessible stairs, on-site fitness facilities, group exercise classes, showers and changing facilities, walking trails and/or playing fields, or sponsor sports teams or events imply the importance of health (Baker, Brennan, Brownson & Houseman et al., 2000). Health policy will only change with the support from the general public, or in the case of a workplace from the employees. Population-based data can indicate what will motivate respondents to exercise by measuring attitudes and desires (Baker et al., 2000).

2.5. Exercise Prescription

An exercise prescription is developed to include the elements of mode (type of exercise activity), intensity of the activity, time or duration of the activity per session, and frequency of exercise sessions (number of times per week exercise is performed). Program design can affect how participants will comply with exercise training and maintain their participation. A prescribed exercise regimen can influence the success and/or compliance of an individual by whether it conveys positive effects. Studies show that participant compliance differs with various exercise prescriptions.

In a study of older adults with knee osteoarthritis who participated in a prescribed exercise program, exercise compliance decreased over the long-term (18 months) (Ettinger, et al., 1997). Better strategies are needed for long-term (indefinite) exercise compliance. Increased intensity of exercise could have increased treatment effects but also may have led to decreased compliance and increased injury. Intensity level has been shown to be inversely related to exercise participation but may also be a greater factor in determining whether or not individuals adopt exercise (Lee et al., 1996).

Factors such as motivation, goal setting and satisfaction with a physical fitness program (how quickly results can be seen) can influence exercise compliance and adherence. The theories of how and why these factors influence exercise adherence are discussed in the next section.

3. Theoretical Models

Several theoretical models pertaining to exercise adherence have been developed over the past 30 years. Some of the most significant models provide a basis for understanding the factors involved in an individual's adherence to an exercise program. These include: the Behavior Choice Theory, the Social Cognitive Theory, Social Ecological Theory, the Theory of Reasoned Action, the Theory of Planned Behavior, the Health Belief Model, the Transtheoretical Model/Stages of Motivational Readiness, and the Transaction Model of Stress and Change. Each model has its own unique constructs interlacing psychological and environmental factors, however many of the models have similarities that link them together. Self-efficacy is one of these similarities, included in Bandura's social cognitive theory, Rosenstock's health belief model, Fishbein and Ajzen's theory of reasoned action, and Ajzen's theory of planned behavior.

Theoretical Models

Constructs of Models

Behavior Choice Theory	Reinforcement value Decision making Accessibility
Social Cognitive Theory	Reciprocal determinism Self-efficacy Reinforcement Observational learning Self-regulatory skills Outcome expectancies Behavioral capability Environment
Social Ecological Model	Objective environment Subjective environment Interdependence Homeostasis Behavior
Theory of Reasoned Action	Cognitive dissonance: mental conflict: know I should/shouldn't but I want to <i>Direct determinant of behavior = intention</i> People consider implications of behaviors Strength of intention depends upon: <ul style="list-style-type: none"> • Attitude toward behavior: belief in given outcome, evaluation of outcome • Influence of social environment: social norms, belief of what significant others think
Theory of Planned Behavior	Theory of Reasoned Action extended to add: <ul style="list-style-type: none"> • Perceived behavioral control
Health Belief Model	Behavior in response to health Readiness to take action depends upon: <ul style="list-style-type: none"> • perceived severity • perceived benefits • perceived barriers • perceived susceptibility Self-efficacy important Value expectancy model: aligned with illness avoidance/health Education leading to adherence
Trans-Theoretical Model / Stages of Motivational Readiness	Stages of behavior change: stable & dynamic Behavior and behavioral intentions of stress and stages of change
Transaction Model of Stress & Change	Stress is unique process between person & environment

3.1. Behavior Choice Theory

As applied to physical activity, behavioral choice theory (Epstein & Roemmich, 2001) posits that one can choose to be physically active or sedentary. In addition, choices can be made regarding type, intensity, and duration of the activity. Choices depend on ease of access, as well as the reinforcing value of the activity, for which there are considerable individual differences.

Applications have been made in the study of childhood obesity, and the role of television and other sedentary outlets. The "access" variable was manipulated by Epstein, Smith, Vara, and Rodefer (1991) in a population of 8-12 year old obese and non-obese boys and girls. When physical activity was as accessible as sedentary activity, both obese and non-obese children were sedentary. As access to sedentary behaviors required more work, non-obese children quickly switched to the more easily obtained option, physical activity. With a further increase in required work, moderately obese children also chose the more easily obtained option. Very obese children never made this switch. This study points out that degree of obesity interacts with choice when accessibility to the activities varies.

Future value from this model may arise from knowledge of how to increase the reinforcing value of an activity so that more people will choose to be more active. Research into how physically active lifestyles can be promoted will lead to public health interventions that are efficacious for a wide range of individuals.

3.2. Social Cognitive Theory

Self-efficacy is an individual's perception that he/she is capable of successfully organizing and executing their skills and resources to perform an action that will lead to a designated outcome (Bandura 1977). The social cognitive theory suggests that there are three self-regulatory mechanisms influencing behavior. These are perceived self-efficacy for outcome attainment, outcome expectations, and personal goal setting (Bandura 1986). The social-cognitive theory then conceptualizes the interaction between the environment and personal behavior, which is a result of psychosocial functioning and self-determination, which is cognition determining behavior. Individuals' beliefs of self-efficacy are internally focused and central to their decisions to participate in physical activity. Outcome expectations, the second self-regulatory mechanism, refer to material consequences, social consequences, and self-reactions (Bandura 1986). When applied to physical activity, the outcomes may also include physiological adaptations, such as fat-loss, increased muscle strength, and improved overall health. However, the performance outcomes of exercise (completing an exercise session) do not directly or immediately result in the outcome expectancy (weight loss, muscle increase, increased endurance). When examining self-efficacy combined with goals and task performance, researchers found that self-efficacy affected goal level, task performance, goal commitment when the goal was self-set, and the choice to set a specific (quantifiable) goal rather than a non-specific goal. There is a lot of support for Bandura's claim that self-efficacy is a central

variable in performance (Locke, et al., 1982). As one begins an exercise program, creating achievable goals then may enhance feelings of success and lead to adherence.

Dzewaltowski (1989) examined the strength of self-efficacy and outcome expectations coinciding with the prediction of exercise participation. He found that higher levels of self-efficacy toward participating in physical activity led to higher levels of the activity being performed. Additionally, the greater satisfaction people felt with the outcomes and the more they believed that there were positive outcomes from activity, the more they participated in physical activity. Dzewaltowski, Noble, and Shaw (1990) found that self-efficacy significantly increased the prediction of physical activity among 254 male and female college undergraduate students. Accordingly, self-efficacy had a direct effect on behavior and was a significant predictor of exercise participation. The contention that self-efficacy serves as mediation between psychosocial cognition (attitudes toward activity, belief in one's ability to successfully perform the activity) and environmental variables in adherence to an exercise program were supported in a study of US male and female Army reservists (Simpson 1999).

3.3. Social Ecological Model

Social ecology models of health promotion are comprehensive, multifaceted, and concerned with environmental factors that influence lifestyle practices. Ecological models posit that behavior does not take place in a vacuum, and that the relationship of the physical environment to people is a crucial variable. Stokols (1992) states that the social ecological perspective includes four assumptions about human health dynamics:

- The healthfulness of a situation and the well-being of its participants are influenced by the physical and social environment. Health status is an interplay between these environmental factors and personal, biological factors as well.
- Health analyses need to address the complex nature of human environments. Environments can be characterized by their objective or subjective qualities, independent attributes (e.g., lighting, noise), or in terms of relationships including several factors.
- The health of participants in those environments may be studied at different levels (e.g., individuals, small groups, organizations, populations).
- The social ecological perspective incorporates systems theory (e.g., interdependence, homeostasis) in order to understand the dynamic interactions between people and their environment.

Social/governmental initiatives that rely on the social ecological approach have focused on increasing each individual's capacity to participate in their environment. Positive changes in health behavior have been shown to result from social ecological approaches (Anderson, 1999; Glouberman, 1999; Stokols, 1996).

3.4. Theory of Reasoned Action

Continuing to examine the behavioral and environmental factors influencing exercise adherence, the theory of reasoned action postulates that *intention* is a direct determinant of behavior (Fishbein & Ajzen 1975). The theory of reasoned action compiles the cognitive, psychological components of attitude and intention with the influence of the social environment to predict behavior. The theory of reasoned action predicts exercise behavior according to a person's intention to exercise, which is influenced by that individual's attitude toward exercising and by the perception one has that significant other people want him or her to exercise (subjective norm).

Fishbein & Ajzen suggest that behavioral intention is influenced by an individual's attitude toward performing the behavior and by their subjective norm (1975). In repeated studies, the element of subjective norm was not significant in predicting exercise behavior, however, intention was the most important predictive variable (Dzewaltowski 1989, Godin 1993). When applied to exercise, one can assess individual beliefs toward being active and attempt to improve those beliefs with positive encouragement. When examining the consequences of a person's exercise behavior, an approach focused on the positive outcomes may improve one's attitude toward engaging in exercise. According to this theory, in order to increase exercise adherence, it is important to favorably influence the individual's attitude toward exercising.

3.5. Theory of Planned Behavior

In order to take limitations into account, Ajzen added *perceived behavioral control* to the theory of reasoned action, naming it the theory of planned behavior (Ajzen 1988). Perceived behavioral control is the perceived ease or difficulty of performing a behavior. Such beliefs are related to the personal perception of the presence of requisite resources or opportunities. Perceived behavioral control is developed from a culmination of an individual's past experiences, second hand information about the activity to be performed, the experience of friends regarding the behavior, and self efficacy.

This model proposes that there are barriers to individual adherence that interfere with behavioral control. These are both intrinsic factors (i.e., skills, abilities, knowledge, and adequate planning) and extrinsic factors (i.e., time, opportunity, and cooperation of others). Depending upon the individual's skills and knowledge regarding exercise behavior, as well as skills for overcoming specific barriers (i.e., time management), the individual will adhere to or drop out of an exercise program. When considered in conjunction with the individual beliefs, attitudes, and subjective norm, the theory of planned behavior has been shown to have a large effect on both the intention to exercise and exercise behavior itself (Hausenblas, Carron, & Mack, 1997). Studies have also shown a significant relationship between attitude strength and exercise behavior (Theodorakis 1994). In the same study, when perceived behavioral control was added to attitude as a variable, the strength of the behavior prediction increased. Overall, as attitude intentions, perceived control, identity, and attitude strength increased, the

greater the connection between intention and actual behavior (Theodorakis 1994). These studies support the predictive effects of the elements of the theories of reasoned action and planned behavior. The next step is to improve individual perceptions of ability and increase the attitudinal strength and intentions.

3.6. Health Belief Model

The health belief model was developed in the 1950's by social psychologists at the US Public Health Service, however, the formal model is attributed to I. M. Rosenstock who further developed the theory in the early 1970's with Becker and Maiman (1975). It examines exercise behavior as a response to perceived health risks. The model has four central constructs, all of which are aligned with the influence of self-efficacy on actual behavioral control. They are perceived severity (of illness), perceived susceptibility (of illness), perceived benefits (of a particular health action), and perceived barriers (to engaging in the health behavior). Exercise behavior may be applied to the health belief model, examining the effects of educating individuals on the benefits of exercise in reducing the risk of disease.

The model hypothesizes that if an individual believes there is an existing health risk and believes that s/he can reduce that risk by engaging in physical activity, then it is likely that the individual will be physically active. Rosenstock has more recently suggested (1986) that self-efficacy is a separate, independent variable that will more fully account for health-related behavior when combined with his original formulation of the model. Janz and Becker (1984) critically reviewed 46 studies utilizing the health belief model and reported significant levels of the four constructs in explaining sick-role behaviors. However, other researchers have criticized the health belief model, implicating that it is not a valid predictor over time.

3.7. Transtheoretical Model / Stages of Motivational Readiness

The Transtheoretical model focuses on the stages of behavior change, decisional balance, self-efficacy, and the processes of change (Prochaska, Redding, & Evers 1997). Within this model behavior change is seen as a dynamic process. The five stages of change are precontemplation, contemplation, preparation, action, and maintenance. The precontemplation stage is when an individual is evaluating the pros and cons of changing his or her behavior, however there is no perception of a need to or desire to change that behavior. During the contemplation stage, an individual has serious intent to change their behavior, although one may remain in this stage for a long period of time. When the individual decides that the pros of behavior change outweigh the cons and starts planning the action to change, s/he is in the preparation stage. This stage is preceded by the action stage, when behavioral changes are being made. After a period of successful change, the maintenance stage is reached, which is a continuation of the changed behavior. This stage continues until the risk of returning to the old behavior has been eliminated. The stages of this model are dynamic; people can move in and out of each stage in varying time frames.

It should be noted that individual components of any of the models might be connected at any given time to influence behavior. If one is highly efficacious and fearful of a hereditary condition, however not ready to change exercise or other lifestyle behaviors, then adherence to a program may not occur. Influencing individuals or groups to focus on the positive rewards of exercise may improve adherence. As Dishman points out in reference to the application of the social norms component of the theories of reasoned action and planned behavior, "the main focus should be upon creating an ambiance where an active lifestyle is the accepted norm.... In the working environment, social facilitation begins with senior management: the key to success is their continued participation, and there may be good grounds for special programming which accommodates their demanding schedules." (Dishman, 1993)

3.8. Transaction Model

The transaction model approaches behavior from the concept that stress, caused by the interaction between person and environment, is only perceived as stress when something is perceived as harmful, a threat or challenge to that person's well-being (Crandall & Perrewé, 1995). As one author describes it, "stress depends on the balance of power, as judged subjectively, between the environmental demands, constraints, and resources and the ability of the person to manage them (Crandall & Perrewé, 1995). Coping strategies are then selected via the amount of individual control one has over a particular situation. The transaction process of dealing with stresses and the occupational environment are dynamic and must be looked at in the context of each particular job. There is a strong possibility that exercise programs are one way to deal with job stress and to develop a sense of community and cohesion rather than rivalry and aversion. Much more research is needed in the application of the transaction model to exercise programs in the workplace.

The most influential elements of adopting an exercise program lie in the positive reinforcement, challenge, and accountability for performance. As seen in the social cognitive theory, as well as the theory of reasoned action, the theory of planned behavior, the health belief model, and the trans-theoretical model of stress and change, there is a complex matrix of individual, social, and psychological variables that affect behavior choices and performance. By encouraging participation through group and individual goals, leading by example, educating people about the multiple rewards of physical activity, and giving positive feedback to bolster self-efficaciousness, there is a possibility of increasing participation across a group in exercise participation.

4. Determinants of Adoption and Maintenance of Exercise

A current and thorough review on interventions to increase levels of physical activity is the October 26, 2001 Morbidity and Mortality Report of the US Department of Health and Human Services, entitled, *Increasing Physical Activity: A Report on Recommendations of the Task Force on Community Preventive Services* (US Department of Health and Human Services, 2001). While the sections below detail more specific investigations of various factors that affect physical activity levels, this USDHHS report provides a comprehensive comparison of several approaches and evaluates their respective levels of success. The Task Force strongly recommends:

- One information approach
 - Community-wide campaign
- Three behavioral and social approaches
 - School-based physical education
 - Social support (e.g., buddy system)
 - Individually adapted health behavior change programs
- One policy/environmental approach
 - Creation of or enhanced access to facilities for physical activity combined with informational outreach activities

The report contains specific suggestions for choosing interventions that match the needs of the community, and cautions that even the recommended and strongly recommended interventions were associated with minimal to moderate behavior change scores

4.1. Adherence vs. Compliance

Adherence, defined as "the quality of adhering; steady devotion, support, allegiance, or attachment" (Webster's Revised Unabridged Dictionary, © 1996, 1998 MICRA, Inc), differs from compliance in the source of motivation. An individual adhering to an exercise program is doing so with self-regulation. However, compliance, "the act of conforming, acquiescing, or yielding," when applied to exercise consistency, describes an individual exercising because another person or institution is requiring it. Therefore, if exercise is performed due to an externally enforced system, those who exercise are complying with that external force. If a program is implemented for the purpose of having a population with a specific level of cardiovascular and muscular fitness, it does not matter whether individuals are adhering or complying, but that they are held accountable for their level of fitness. When examining the effects of other-influenced activity (i.e., group training vs. individual training or monitored activity vs. unmonitored activity) on consistency and persistency of exercise, it should be noted that self-motivation combined with encouragement from others has been shown to influence the greatest levels of adherence to an exercise program (Bungum, Orsak & Chng, 1997).

4.2. Motivation

Motivational strategies can enhance participation in an exercise program. The following guidelines incorporate the strategies that have been proven to be effective. The exercise program should be moderate in intensity for those who are not previously physically conditioned (Ballor et al., 1988). Encourage group participation, the social reinforcement and interpersonal influence can positively affect adherence (Sullivan, 1991). Incorporate goal-setting, periodic testing, and progress charts to illustrate and document fitness achievements. Acknowledge accomplishments with a reward system, and provide quality leaders and instructors. The BeWell program at Covenant Health, Get Fit MMCer program at Methodist Medical Center, Wake Forest University Baptist Medical Center and the Centers for Disease Control and Prevention have all used cash rewards and incentive prizes, with much success, to encourage employee participation in fitness (American Health Consultants, 1999; Covenant Health, 1998).

Pairing up with a partner can be a great motivator by offering companionship and encouragement. People who pair up are more likely to stick to a fitness program than without (Missett, 1999). An on-line survey showed that 90% of women who exercise with their mates found that it improved their relationship because they had something in common, it improved their communication with and each had increased energy. Those who exercise with a partner can increase their chance of success, are less likely to skip a workout, and can coach and monitor each other. Wallace, Raglin, and Jastremski (1995) found that married couples who exercised together were more likely to continue a fitness program at six months than those who were married but did not work out with their spouses.

Motivation can come from goal setting such as a desire to lose weight or to build the endurance to finish a race. An external driver such as the requirement to pass a physical fitness test, or meet certain job demands, like combat readiness for the military, may serve to motivate one to exercise. Setting goals can be an effective way of reaching greater levels of fitness, increasing individual attachment to the physical activity that will improve performance. According to Locke's goal setting theory, (Locke & Latham, 1985) goals need to be specific and challenging. When comparing groups of exercisers with "do your best" goals or specific goals, those with specific, hard goals performed significantly better (Tennenbaum, Weinberg, Pinchas, Elbaz & Bar-Eli, 1991). Locke and Latham point out the need for goals to be realistic, otherwise the resulting failure will discourage continued motivation. The authors also recommend using a combination of short- and long-term goals in order to keep significant motivation in the present while striving for progress. Also for the purpose of continuing motivation is individual involvement in setting goals (Kyllo & Landers, 1995). An additional recommendation is to monitor and chart progress towards reaching the goal. A facility that can custom design and monitor programs and provide competitive activities will improve participant satisfaction (DiMenna, 1995).

Competition acts to serve as a motivator for some whether among teams or individuals. At Kaiser Permanente in Georgia, teams were set up across ten different facilities to compete for the highest level of activity. This resulted in a high of 88% participation for one facility and an average of over 55% for the others. (American Health Consultants) Early exercise programs existed as corporate-sponsored sports teams to encourage activity and building team spirit, but participation has historically been low (Shephard, 1999). Company-sponsored sports leagues and clubs still exist and serve as healthy competitive outlets for employees and should be encouraged.

Numerous studies have examined the determinants of physical activity adoption and maintenance. Determinants include a sense of community, environment, attitudes, knowledge, and approaches to an exercise program (structure of the program) among others. Social environment seems to have the most influential effect on human behavior since it is tangible and has an effect on an individual's internal characteristics such as attitude, knowledge and behavior. Results of studies that compared group versus individual based exercise programs are good examples of how human interactions can affect the adoption of exercise and the effectiveness of an exercise program

"Appropriate changes in the social environment will produce changes in individuals and that the support of individuals in a population is essential for implementing environmental changes" is stated in the ecological, or systems, model of human behavior from McLeroy, Bibeau, Steckler, & Glanz (1988). A report of the determinants of physical activity in the community found it necessary to consider individual, interpersonal, community, organizational and governmental influences when looking at environmental factors that affect health-promoting behaviors (Baker et al., 2000). This is to imply that there is a need to look outside individual characteristics (attitudes, knowledge, skills, and behaviors) associated with adopting and maintaining regular exercise. Attitudes and collective behavior (norms) can serve as barriers because they take so long to change and serve as the intermediary step between modifications in environmental factors and adoption.

Interpersonal and community factors included social support, environmental enablers and barriers and policy attitudes and effects. Social support includes emotional, informational, appraisal aspects of relations with other people (individual and groups). Social support from family, friends, or exercise program staff clearly influenced physical activity determinants as shown in a number of previous qualitative and quantitative studies. There are differences in the types of social support that are effective among the genders and age groups. Women tend to thrive from family and friend support and were more likely than men to exercise with a group. The young prefer group exercise as compared to older (60 years and older) subjects. For youth, there are strong social influences on physical activity and activity can usually correlate with family participation and support.

At the community level, enablers and barriers can impact an individual's determination of whether to engage in heart healthy community activities, including

physical activity. "Community" can mean a neighborhood, a group, an institution or organization. Perceived fears, trust and helpfulness from the community can create a perception of whether or not a neighborhood is "safe". Unsafe neighborhoods, where there is mistrust and fear among the populace, are associated with increases in inactivity. Those inhabitants with a 'sense of community' were more likely to be more active.

Areas with lower levels of social capital, defined as social processes among people and government to accomplish goals of mutual benefit, have lower ratings of health. Environmental and policy approaches should be exposed to all people, rather than focusing on an individual, to help modify behavior and lifestyle changes. This can be exemplified by providing accessible fitness facilities (bike trails, gymnasiums, etc.) land use, promoting physical activity during the workday and health promotion in order to provide a sense of safety and make activity enjoyable.

A meta-analysis by Dishman and Buckworth (1996) surveyed the efficacy of interventions for increasing physical activity implemented by community and clinical medicine. They found that mediated and face to face approaches in a community will increase participation in a variety of moderate intensity exercise for a sedentary population. Larger effects have been seen when interventions are based on the principles of behavior modification, especially in a group setting or during unsupervised physical activity, with an emphasis on low intensity exercise. Without regard to sample size, interventions were most effective when they used behavior modification approaches that tended to combine reinforcement and stimulus-control. Combining approaches was effective, as well as, targeting patient populations, as compared to apparently healthy populations. Cognitive behavior modification techniques combined with other interventions had the same effect size as studies that used cognitive-behavior modification alone. Most studies using cognitive-behavior modification did not base the intervention on a theoretical model of behavior change. It is worth noting that a review of the literature showed that health education or health risk appraisals were not effective interventions. They concluded that increases in physical activity or fitness, associated with the interventions, were diminished and usually returned to original activity levels in the long-term once the intervention ended.

In a comparison of whether adoption and maintenance of exercise varied between a group vs. individual (home-based) exercise program, results showed that participants in home-based exercise reported a marginally significant greater frequency of exercise per week than those in the group condition (Perri et al., 1997). Full adherence (5 days/week, 30min/day) declined significantly during months 7-12 in the group condition only and the participants in the home condition had significantly more weeks of full adherence than participants in the group condition, both overall and during the second 6 months of the study. The home-based group demonstrated superior performance compared to the group program in the areas of exercise participation, treatment adherence and weight loss. Attrition in the home-based program was significantly lower than in the group program and long-term superiority of the home-based program in exercise participation and weight loss was evident for both treatment completers 90 and all participants.

Though the rate of participation declined for both groups, it was greater for the group condition. Time demands were the most common reason for withdrawal from the group-based condition.

In a similar study by King et al. (1997), individuals assigned to a home based exercise of either high or low-intensity had a significantly greater probability of adhering to their regimen on the first year (67.6 % were successful) than did individuals assigned to group-based exercise (44.4% were successful). In Year 2, those with the lowest likelihood of adherence were overweight (BMI>27) and participated in the group-based (28.2% successful) exercise program. Cigarette smokers with a high level of family satisfaction score in the home-based were only 21.7% successful. The highest likelihood of success was experienced by non-smokers reporting lower stress levels at baseline in a home-based program (82.4% were successful) and those with normal-weight (BMI≤27) who reported higher energy scores at baseline assigned to a group-based program (80.0% successful). The determinants of behavior change in this study are those suggested by social-cognitive theory.

4.3. Lifestyle, Demographics, Environment and Genetics

Determinants of exercise maintenance and associated health factors depend on lifestyles and certain genetic traits. A 1996 study reported that there has been little success in increasing physical activity among people of racial or ethnic minorities or older ages (Dishman & Buckworth, 1996). Such claims are defended in a number of studies.

4.3.1. Gender

A recent study of the overall Air Force population demographics associated with fitness and the ability to pass the physical fitness test found the following results. Demographic factors of the overall Air Force population for passing but at high-risk for low fitness were: older age, senior enlisted, Blacks. For men, the significant predictors of low fitness were: overweight/obese, exercise less than 3 times/week, smoker. Men who failed and exercised greater than or equal to 3 times/week did not lower their risk for low fitness in one year. There are a number of possibilities for their inability to pass the test. One may be that the type, intensity, and/or duration of their training exercises were ineffective, or they may simply not have performed well on the day of the fitness test. Another recently explored factor that should be acknowledged is the genetic, familial predisposition to low or high physical adaptation to exercise training, examined by Claude Bouchard and his colleagues in the HERITAGE family study (Bouchard & Rankinen, 2000). They found that age, sex, race, and baseline cardiovascular fitness only accounted for about 11% of the variance physiological response to 20 weeks of exercise. However, familial factors (genetic and environmental) did contribute significantly to the exercise training response. Such factors may need to be considered when designing exercise programs in the future.

For women in this study, there was a smaller number of this cohort and factors had a lower impact. Women who failed but were at high-risk for low fitness were: older age and blacks. Women who passed and had a smaller risk of being unfit exercised greater than or equal to 3 times/week. Women who failed and were at high-risk for low fitness yet exercised greater than or equal to 3 times/week would have to exercise more than their counterparts that had passed in order to pass the re-test. Previous-year failure of the Air Force fitness test may well be a marker for low trainability (and genetically lower VO_{2max}) which would explain why aerobic exercise frequency and other environmental factors had smaller effects among those who failed testing the previous year (Robbins, et al., 2001). Explanations of these findings may be found in other studies that determined gender to not be a significant predictor of exercise behavior (Emery, Hauck, Blumenthal, 1992). Racial differences in body composition may be playing some kind of role in the findings that black race tends to be a predictor of low fitness (Robbins et al., 2001).

4.3.2. Personality Traits

When considering personality traits pertaining to adherence it has not been determined as to what personality types tend to participate in regular exercise. However, one study found that between two exercise groups, aerobic and strength & flexibility, showed decreases in overt behavioral manifestations of the Type A behavior pattern and self-reported Type A traits in men (mean age = 44.4 years) (Blumenthal, Emery, Walsh, et al., 1988). Aerobic exercise also serves as a method for reducing cardiovascular risk among healthy Type A men.

4.3.3. Upbringing and History of Inactivity

An individual's upbringing has been known to affect his/her adoption and maintenance of exercise as an adult. Older adults may encounter more barriers to exercise maintenance including health problems and social norms that have not encouraged exercise (Emery, et al., 1992). Long-term compliance is difficult to maintain in older adults that have been previously inactive (Ettinger, et al, 1997; King, et al, 1997). Greater barriers to exercise participation among older women are likely due to poor exercise habits learned in adolescence (O'Brien & Vertinsky, 1991). Longer histories of exercise and lower BMI, have shown to predict increased doses of physical activity (Lox, et al., 1999).

4.3.4. Age

Age is a factor to consider when analyzing the adherence and maintenance of an exercise program. Younger people tend to engage in greater amounts of physical activity than their older counterparts (Lox, et al., 1999). Leslie, et al. (2001) explored the decline in vigorous activity among males and females between 18 to 29 years old. They found that moderate to vigorous activity is greatly reduced between these ages, especially in females. Additionally, age-associated activity levels were most apparent among the

males in this study, who participated in more vigorous activity at younger ages. Pate, et al. (1998) discovered that physical activity in rural 5th, 6th, and 7th graders is associated with self-confidence and the ability to overcome barriers to physical activity. Pate's study empirically supports the Social Cognitive Theory, implicating that self-evaluation and believing in the positive effects of physical activity are necessary for rural youth to overcome barriers and distractions that prevent activity and fitness.

Healthy older populations can adapt to training, even at a very old age. (Letter to the editor, Adaptations to exercise training in healthy older people, MSSE, 941-942) The most common reason older adults (age =67± 5years) (94% of n=101 men & women) gave for continuing with physical activity was that it kept them in good shape and good health. The second most common reason was improved energy level and alertness (Emery, et al.,1992). Even for older adults with certain maladies associated with aging, such as knee osteoarthritis, exercise training (aerobic and resistance/ muscular strength) is recommended (Ettinger et al., 1997). Age (women, aged 60-85 years) (n=102) was a significant inversely correlated factor for adherence to a 12-month exercise trial. Though age was not a useful predictor of adherence as were other measures (Williams & Lord, 1995). In a study of sedentary, overweight women, those who engaged in lower intensity exercises reaped the benefits of exercise and adhered to their program better than those who attempted higher intensity exercises.

4.3.5. Smoking and Drug Use

A history of drug use affects the adoption and maintenance of exercise. Psychoactive drug use was (one of the factors) significantly associated with variance in adherence to the 12-month exercise trial in female subjects aged 60-85 years (n=102) (Williams & Lord, 1995). Smoking was an early predictor of those who would not adhere to an exercise regimen. Smokers did not stick to the first year of a prescribed exercise program in a study by King et al. (1995).

4.3.6. Medical History

For cardiac rehabilitation patients, intensity levels and perceived effort are negatively associated with adherence. Since cardiac benefit is dependent on attendance of exercise sessions and achievement of target heart rate, one study looked at two aspects of adherence: target heart rate and exercise attendance. Of 197 subjects, 87 were assigned to the low intensity program and 110 to the high intensity program. The demographics for the majority of subjects were white, married, worked full-time, had some post high school education, were ex-smokers and did some exercise. Older patients and non- or ex-smokers were more likely to attend sessions for both groups. Attendance was not associated with target heart rate. The high intensity group had less disparity between target HR and achieved HR after 1 year than after the first 6 months. (Lee, et al., 1996)

4.4. Physiology

4.4.1. Body Composition

There is a wealth of research examining the effects of diet and exercise on body weight and body fat (Blake, et al., 1999; Miller, et al., 1999; Pavlou, et al., 1989; Schoeller, et al., 1997) which indicates that a sound diet is important for weight loss, as well as regular physical activity. Exercise has also been deemed a crucial element in maintaining weight loss in the previously obese (Schoeller, et al., 1997). As previously noted, the actual loss of weight may not be the only indicator of the health benefits of exercise. This information may be useful in prescribing programs and influencing motivation in those who perceive weight loss to be the only positive outcome of an exercise program. Group leaders and those involved in implementing the exercise programs may increase adherence if they emphasize the multiple health benefits of exercise other than weight loss alone. (Palmer, Rench, Carroll & Constable et al., 2000)

BMI and perceived stress level were significant predictors of adherence during the first and second years of an exercise program (King et al., 1995). Slower reaction times and reduced muscle strength in women, aged 60-85 years (n=102) showed significant inverse correlation to adherence in a 12-month exercise trial (Williams & Lord, 1995).

4.4.2. Disease Prevention

The evidence repeatedly suggests that regular physical activity protects against the development of cardiovascular disease (CVD) (Bouchard et al., 1994; Bouchard, Shephard & Stevens, 1994; Haskell et al., 1992). This protection is due to the primary effects of exercise on improving cardiovascular health. Additionally, it is due in part to the favorable effects of physical activity on other CVD risk factors, such as high blood pressure, blood lipid levels, insulin resistance, and obesity (Gillum, 1996 ; Haddock et al., 1998). Studies have shown that there is a 20- to 50- percent greater risk in developing hypertension for inactive people when compared those who are active. A researcher at the University of Wisconsin found that walking on the treadmill for 45 minutes decreased patients' blood pressure below resting levels for up to two hours after they finished walking (1996). In a more specific examination of how much one needs to walk to reap its protective benefits, Sesso, Paffenbarger, Ha, and Lee investigated 1,564 women (mean age 45.5 years), initially free of CVD, from 1962 until 1993. They looked at the number of stairs climbed, blocks walked, and sports played, dividing those numbers into approximate thirds (<500, 500-999, 1000 or > kcal/week). During those years, 181 cases of CVD were identified. The researchers adjusted for other coronary risk factors, and compared the three groups of kcal expended, including the association of body mass index to CVD risk. The results showed a 33 percent decreased risk for those women who walked at least 10 blocks per day (approximately 6 miles per week). In addition, there was an inverse association between lower body mass index (<23 kg/ m²) and CVD.

Type II diabetes is another disease that is closely associated with lifestyle factors and can be controlled through diet and exercise (Tremblay et al., 1991). When obese women were put on an exercise regimen for 15 months, then asked to adhere to a low-fat diet for the following 14 months (while continuing to exercise), a substantial reduction in plasma glucose, plasma insulin, and cholesterol levels were observed. Additionally, insulin response increased, indicating an improvement in carbohydrate metabolism and normalization in the level of risk for diabetes. Interestingly however, the women did not reduce their body fat levels below the obese range. Thus, the positive health benefits of exercise are not necessarily a product of a significantly reduced weight. Although obesity may be a product of inactivity and overeating in some individuals, there may be other, genetic components involved in body composition. It is well established, however, that exercise and a low-fat diet improve the metabolic profile and decrease disease risk.

4.4.3. Genetics

Genetics influence body composition, disease risk and physical fitness (Bouchard et al 1992). Ravussin et al (1988) did a landmark study involving almost 300 American Pima Indians, a population known to have very high levels of obesity and diabetes. The researchers discovered familial traits in low or high rates of energy expenditure, even when controlling for age, sex, fat-free body mass, and fat mass. This means that individuals can be "energy efficient" and expend fewer calories of energy to function simply due to family heritage. They also found familial similarities for blood pressure, serum cholesterol, and body-mass index. Genetic factors have also been examined through studies on twins. Even when reared apart from one another, identical twins are much closer in body weight at middle age than are fraternal twins or siblings (Fontaine et al, 1985). However, a study of 6,000 twins in Finland found that lifestyle factors were more important than genetics in determining weight gain over a six-year period (Korkeila et al., 1995). Conclusively, some individuals may be genetically predisposed to specific diseases, including obesity. Therefore, it is essential that individuals engage in physical activity, and it is more imperative for some people with certain genetic traits than it is for others.

4.4.4. Depression

Over the years, numerous studies have investigated both aerobic (e.g. running) and anaerobic (e.g. weight lifting) exercises as interventions to decrease depressive symptoms. The effectiveness of regular exercise (either aerobic or anaerobic) is being compared to that of antidepressant medication that regulates neurotransmitter activity (Dishman, 1997; Blackwood, et al., 1998; Greist, et al., 1979). These significant studies have repeatedly concluded that both aerobic and anaerobic exercise has a positive effect on depression (Dishman, 1997). There is uncertainty and speculation about the cause of mood-lifting effects of exercise. Many studies have found an inverse relationship between exercise and depression (Martinsen, et al., 1989) and the most depressed individuals have the greatest improvement in mood after regular exercise as well as those who exercise the most (e.g. five as opposed to three times/week of exercise (Folkins,

1976). Additionally, those who are in the poorest physical condition show the greatest improvement in depressive symptoms (Greist, et al., 1979). The reason for the alleviation of depressive symptoms following exercise has been hypothesized in several ways, but is neither clear nor conclusive (Holmes & Roth, 1993; Ossip-Klein, et al., 1989). One proposed cause is the possible significance of improved feelings of self-efficacy and self-worth (Ossip-Klein, et al., 1989). Such feelings may indeed affect mood and contribute to depression when they are low, however when studies are conducted with non-depressed, normal-mood people exercising there seems to be neither an enhancement in positive mood nor an alleviation of negative mood (Lennox, 1990).

4.5. Psychological Motives

Physical activity has been known to have positive effects on improving mood, self-esteem and self-efficacy. This conveys that there are more than physiological benefits to exercise participation. Psychological/behavioral, social and physical perceptions were measured for subjects participating in exercise groups that included aerobic exercise and yoga/flexibility or control (no exercise). Measures improved after a 4-month exercise program for older men and women (mean age=64 years). The study was not aimed to manipulate depression but improvements in mood, quality of life, lower anxiety, better self-confidence and self-satisfaction were revealed. Additionally, perceived changes that improved for over 50% of subjects who exercised were overall health status, energy, mood, self-confidence, life-satisfaction, ambition, flexibility, physical endurance, weight, appearance, and concentration. Perceptions that stayed the same for over 50% of subject population were sleep, bowel function, memory, social life, eating habits, loneliness, family relations, and sex life (Blumenthal, et al., 1989).

For women (n=102), aged 60-85 years, self-reported improvements in general fitness, general health, sociability, mood and outlook at the end of the first 10-week term of a 12-month exercise trial were significantly associated with adherence (Williams & Lord, 1995). Even the perception of benefits can motivate individuals to exercise. When participant starts to recognize benefits and reach goals, adherence will improve (DiMenna, 1995). Perceived self-esteem, self-satisfaction, and self-efficacy improvements, along with social support, may have served to enhance feelings of self-confidence and self-esteem. It may be possible that a longer intervention (>4 months) may have had significant changes in psychological effects (Blumenthal, et al., 1989).

Increased exercise efficacy and positive affect, increased internal stable and personally controllable attributions and decreased controllable attributions and negative affect predict increased doses of physical activity in one analysis (Lox, et al., 1999).

4.6. Incentives

Motivators that serve to encourage individuals to exercise include incentives, goal-setting, and competition. Incentives that are tangible have been used with success such as t-shirts, hats, and movie tickets to promote participation in physical activity and

exercise programs. High participation rates have been due to achievable goals and participation in moderate activities that included dancing, Frisbee, and grocery shopping. Fun exercises and activities of daily living (ADL's) can be acceptable moderate activities that improve individual fitness levels (Employee Health & Fitness Archives, 1999). Wellness programs, especially in corporate settings, are using financial incentives to encourage healthy behavior. Incentives serve to motivate those "on the fence" and include bonuses, reimbursement of health-related expenses and discounts on health insurance premiums. Rewards are appealing, penalties are not (Brotherton, 1998).

Satisfaction with a physical fitness program is the main determinant of whether an individual will continue with his/her program. Exercise programs that are limited to the indoors using stationary aerobic machines on a regular basis can get boring and requires an individual to be self-driven and self-disciplined (Finan, 2000). Functional and sports-specific personal training such as for golf or tennis can help with motivation and self-improvement. Mountain biking, rock climbing, hiking and outdoor activities that enhance body and spirit, in the place of the treadmill, are becoming popular and are personalized to the adventuresome. People who adhere to physical activity report perceiving the activities as fun, relaxing, or challenging in a positive way. Participants disliked activities that they thought were boring, painful, or monotonous and engaged in activities that provided them with positive experiences and that they felt they could perform well (Rendeiro, et al., 1987).

5. Candidate Issues for Air Force Specific Applications

5.1. Program Justification and Implementation

Once the program has been justified for implementation, program goals and objectives should be determined by surveys to assess needs and interests and continually followed up with assessments to plan and implement programs. This establishes employee ownership and provides flexibility in the program. The most critical period in determining a program's success is during program initiation. During the initiation phase, it is important to recruit enough employees to ensure some level of adherence and justification of the program. Needs and wants as determined by the surveys will serve to address staffing and type of facility. (Baun & Bernacki, 1988)

Shepard (1986) asserts that with better understanding and manipulation of belief shaping factors and behavior regarding exercise, recruitment and adherence into corporate programs could be improved. Exercise beliefs become apparent through testing/screening of past and present behaviors. Testing may be a good way to show the legitimacy of a program while providing a baseline to the participant. Screening also serves to enforce/maintain safety by checking participants' health status. Screening/testing also provides participants the knowledge of their fitness level and to ensure the trust of the facility/medical staff. For initial and continued screenings, a physician and/or exercise physiologist may provide an exercise prescription. The Air Force may want to introduce more frequent testing opportunities that aim to prepare the member for the annual fitness assessment. (Baun & Bernacki, 1988)

5.2. Program Maintenance

Program maintenance often begins after the completion of the first year. By nurturing current members, enrolling new non-exercisers and new employees (new members of the organization), focus shifts to target specific motivational support for special groups. Long-term absences get a friendly (sometimes comical) reminder of new programs and/or program changes that the program/facility has to offer to encourage the member to return or else lose certain privileges such as a locker, etc. (Baun & Bernacki, 1988).

Reporting participation will serve to monitor the success of the program and adherence of its participants. Activity and participation assessment can consist of statistical reports that record age, sex, frequency of activity, and type of activity. Common statistical measures are penetration rate, adherence rate and daily attendance. The penetration rate can then be calculated as the number of sessions exercised in a month divided by the total employee population. The highest participation rates are historically seen between January and March while the lowest rates occur in December. By gender, the highest rates exist for males younger than 40 years and young females. The most difficult group to motivate is males over 39 years as shown by the lowest rates of participation.

The adherence rate is the number of employees exercising at certain frequencies per month. Daily attendance may be recorded to provide feedback on trends in weather, sales in stores, holidays (i.e., Monday is the busiest, Friday is the slowest, therefore monthly attendance averages are different for Monday-Thursday and Monday-Friday). A flex-time work schedule can be beneficial, so long as employee and supervisor agree to it, in helping the employee find a more convenient time for them to exercise rather than being limited to before or after traditional working hours (i.e., 9am-5pm).

5.3. Program Success Factors

The factors that have been linked to successful exercise programs and should be considered for integration into an Air Force fitness program include the following.

5.3.1. Support Group Adequacy

Co-workers, a spouse, and/or family need to be supportive of the member's participation in regular fitness efforts. It is important for significant others to be involved or informed of the activity program in order to provide positive reinforcement (i.e., program may provide mixed social events).

Support may also come from group participation. Females usually prefer groups in exercise settings, in particular, though males have also been known to tend towards groups. The reasons for this preference are commonly group identification and commitment, social reinforcement, competitive stimulation, team activities, camaraderie, support of a leader and social support outside of the group (when positive). Buddy support can have similar effects and serve as reinforcement and motivation to exercise.

An example of how the support system worked for one fitness trainer was the technique of "team training" for 12-weeks. As the support system increased, the clients began to reach their desired results. An educational component was also provided on a weekly basis with topics including behavior change strategies (nutrition, weight management) and identification of an "excuse" list where clients identified their excuses but were encouraged to "do it anyway". (Kiefiuk, 2001)

5.3.2. Fitness Skill Level

The member should choose those activities that have had successful outcomes in the past in order to build upon previously developed skills and to incur a sense of mastery. This also serves as an intrinsic motivator as the member realizes that they possess a certain skill that they may choose to perfect or compete in.

5.3.3. Injury

It is important not to aggravate old injuries, which may prevent further participation in activity. Early identification is helpful to prevent further inconvenience and to find other activities that the member may participate in.

5.3.4. Convenience

Convenient times and locations that meet the demands of the member's schedule are important for exercise to become a routine or regular activity. Exercise should become a regular part of daily life.

5.3.5. Satisfaction

The participant's understanding of satisfaction derived from physical exercise must be known. Each individual will have his/her own set of goals. Goals should be identified such as (weight loss, increased strength, released tension) and the time and effort it will take to reach those goals should be clear to the participant. Meeting goals leads to success, which leads to adherence.

5.4. Motivational Strategies

Fitness centers are continually challenged to find ways for participants and to maintain and/or increase adherence levels. Self-motivation has been found to be strongly linked to adherence. The problem is finding a result that creates the desire for an individual to want to change or work towards. Peer pressure serves to define the cultural belief that healthy and fit is attractive. As a result, successful programs market a healthy image that is associated with exercise and that it is fun to participate while it provides the opportunity to be with other people. The key to success is that variety, choices and continual challenge lead to adherence.

An individual's attitude toward activity or an exercise program is critical in determining their participation and eventually their long-term adherence. Intrinsic enjoyment is essential. The desire to be healthy is not enough to motivate someone to exercise on a regular basis. The activity should be perceived as fun so that the individual looks forward to his/her participation. Since everyone has a different idea of what is fun, programs need to be flexible enough to meet individual interests and change with the population and new trends.

Realistic challenges and testing one's skills is important to intrinsic interest and enjoyment. The "flow" or "in the zone" experience (defined by Hungarian-American psychologist Mihaly Csikszentmihalyi) is known as the contraction of the perceptual field, a heightened self-awareness that may result in the merging with the activity and the environment. The merging of the action and awareness contributes to the "flow"

experience, as well as, having a sense of control over one's actions through clear, unambiguous feedback, clarity of goals and total concentration on a limited stimulus field (Tolson, 2000). This ties into the idea that environment is important in maintaining stimulation and interest. For example, running a cross-country course is less boring than running a lap course or treadmill, where the scenery does not change.

Perceived competence can be a barrier to exercise participation, especially for many adults. Those who have a perception of youthfulness associated with a sport/activity or have had a negative experience in sport in their youth tend to be disinterested in participating in an activity. This presents the challenge of how to make vigorous activity attractive in the beginning stages so as to continue participation until more distant benefits are realized.

Extrinsic motivators such as incentive-based reward systems are important especially in the early stages of program (i.e., fitness challenge) and should be geared towards those with the lowest adherence potential. For best results, goals for incentives must be clearly understood and attainable for *all* participants. The purpose of incentives as extrinsic motivation is to facilitate behavior change leading to exercise adherence.

5.5. Attrition Avoidance

Reasons for attrition from exercise programs are varied but can be avoidable. Most commonly, people found the program was too time consuming or interfered with job responsibilities. A family illness or other related commitment interfered with participation, as well as, school or a second job. The lack of interest, lack of enthusiasm or any of the mentioned reasons used as excuses to not participate. And finally, expensive or time-consuming travel to a facility, injury or lack of communication with exercise staff have been recognized as barriers preventing regular participation in exercise programs.

Time seemed to be the unique behavior pattern of dropouts. When looking at a corporate setting, it was thought that those with the highest dropout rate (mid-level managers) would have better control/management of their time but it appears this is not so. Therefore, it becomes important to isolate the true barriers from *perceived* barriers and *motivational* deficits.

5.6. Occupation Related Fitness and Exercise Adherence

Though there are some professions that realize the importance of fitness and agree with higher standards of testing (i.e., law enforcement), they tend to show little initiative to keep themselves prepared for the physical requirements of the job. This may be attributed to two types of rationale, 1) behavior issues of the employees that tend towards non-adherence and 2) management has not recognized the cost effectiveness of implementing/enforcing physical fitness program. Justification for management implementation and employee acceptance of required physical fitness training for these types of jobs is that it must affect job performance. The tasks demanded on the job and the frequency of those tasks should be identified to determine what employees should be fit for or be able to survive. (Gettman, 1988)

6. Conclusion

It is recommended that physical fitness be generally emphasized as health-related rather than task-related by emphasizing the components of job-related readiness, health and disability risks of unfit lifestyles such as the inability to react to a high-stress situation and high incidence of back problems. A comprehensive physical fitness program should include aerobic power/cardiovascular endurance, muscular strength & endurance, and flexibility training while periodically monitoring body composition.

Management participation leads to a program's success when there is leadership by example. Some of the administrative approaches that organizations have used are described here. The *voluntary* approach is that which management provides the necessary equipment and education through educational materials. This is the least effective approach. The *revolutionary* approach upholds certain criteria to be met and failure to comply leads to disciplinary action yet there is no regular program for maintaining conditioning. Finally, the most effective approach is *evolutionary*. This approach supports indoctrination into the program, testing for current health and fitness status, and provides assistance to meet the requirements so that the program may eventually become mandatory.

For motivation in training, a strong leader who communicates well with the team and can assure that personal information is kept confidential provides encouragement and feedback. Strong leaders have been recognized as a successful motivator. Team dynamics become very complex in a training and competitive situation. (Tracy, 2000)

Suggested baseline characteristics for implementing a more successful Air Force fitness program:

1. Encourage the integration of physical activity as a part of daily life. Assist in scheduling convenient times and finding locations of a fitness facility or other location at which the individual will choose to exercise.
2. Provide education and adequate supervision in the early stages of the exercise program so that the individual will recognize benefits and meet reachable goals.
3. Track and assess the type and amount of activity regularly (i.e., every 2 weeks) to monitor success and attendance rates.
4. Maintain good communication and schedule regular follow up sessions for continued adherence.

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